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INSTRUCTION MANUAL

ORDER NO. 384

Model 12 AVQ PN 801232

General Description

This vertical antenna is designed for operation on 10, 15, and 20 meters. It is designed to work against earth ground, or a radial ground system. When used in conjunction with a resonant radial system, the vertical antenna becomes very efficient with a low angle of radiation and excels in DX communications. A simulated radial ground system (Model 12 RMQ) is available from your local Hy-Gain dealer. This manual tells you how to construct your own radial system.

NOTE: If you mount the antenna, then find the roof space is too small for the radial system, you can droop the radials over the roof at almost any angle without seriously changing the performance of the antenna.

WARNING:

> ***When installing your system, take extreme care to avoid any accidental contact with power lines or overhead obstructions. Failure to exercise this care could result in serious or fatal injury.***

Construction

It is designed to fit a 1⅝" mast. A 1¼" plumbers pipe has a 1⅝" outside diameter and is highly recommended for masting material. This is the minimum masting material which will meet the severe weather survival specifications of this antenna. The warranty is void if a lighter mast is used.

The Model 12 AVQ is made of high quality seamless aluminum tubing for maximum strength. The Hy-Q traps are durable and highly weather resistant.

Specifications

Mechanical

Overall height	13′ 5⅜" maximum
Wind survival	80 mph
Mast bracket accepts	1⅝" outside diameter
Net weight	9 lbs. approx.

Electrical

Input impedance	52 ohms
Frequency range	10, 15, and 20 meters
SWR at resonance	less than 1.5:1
Maximum power output	1 kw AM
Lightning protection	DC ground
Feedpoint termination	SO-239

SWR and Feedline

The Model 12 AVQ antenna is designed to match 52 ohm coaxial transmission line. By following our detailed instructions and measuring accurately, an SWR of 1.2:1 at resonance may be obtained. An SO-239 coax receptacle is mounted in the base of the antenna for maximum weather protection.

NOTE: If the input terminals of the SO-239 input connector are checked with an ohmmeter, they will show a direct short. *This is normal!*

Assembly

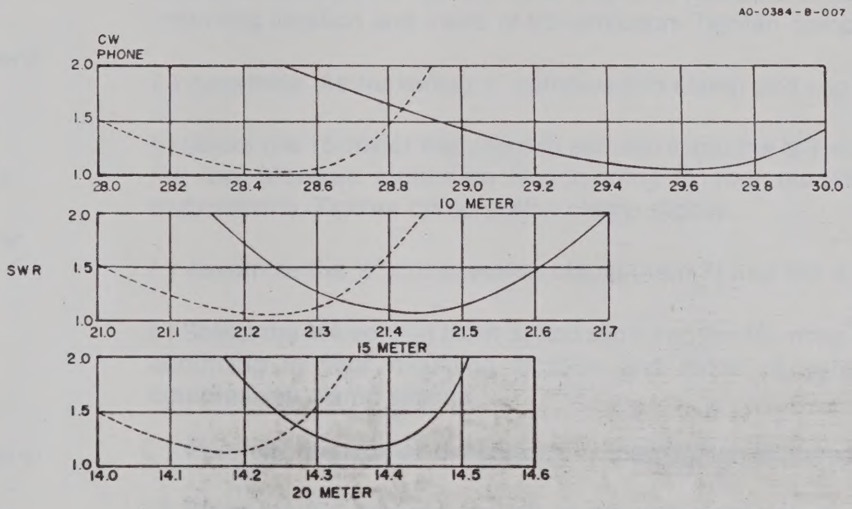
( ) To become familar with the antenna and to simplify the assembly, read through the entire manual before beginning.

( ) Unpack the parts and check them against the Parts List and drawings.

( ) Determine where to mount your antenna (roof top or ground) and what mode of transmission to use (Phone or Continuous Wave). Take note of the dimensions in the manual. For the antenna to operate at peak efficiency, these measurements *must be accurate.* The typical VSWR chart should help you decide the best mode for your purposes.

CAUTION

Do not try to adjust one band for Phone and another band for CW or the antenna will not operate properly. All bands must be set either for CW or for Phone.



VSWR CURVES

( ) Select the base assembly (item 4) and the 1¼" compression clamps (item 8) with its associated anchor screw and square nut (item 14 and 15). Assemble the compression clamp as shown in Figure 1 and slip it on the end of the base assembly. *Do not tighten at this time.*

Compression Clamps

Take care when measuring the tubing lengths for your mode of transmission. Place the clamp near the end of the tube with the joint even with slot in the tube. Tighten the clamp until the inner tube cannot be turned in the outer tube.

Do not tighten the compression clamps.

NOTE: To save time, loosely assembly all of the compression clamps and their appropriate hardware before beginning further installation of the antenna.

NOTE: With ½" compression clamps (item 7), use # 10 x 1" bolt and nuts (items 11 and 15). With 1" and 1¼" compression clamps (items 8 and 9), use #10 x 1½" bolts and nuts (items 14 and 15).

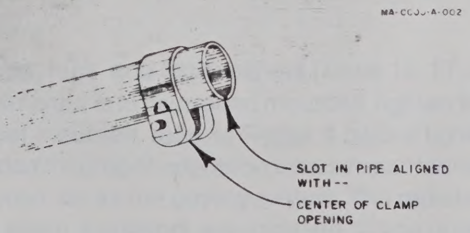
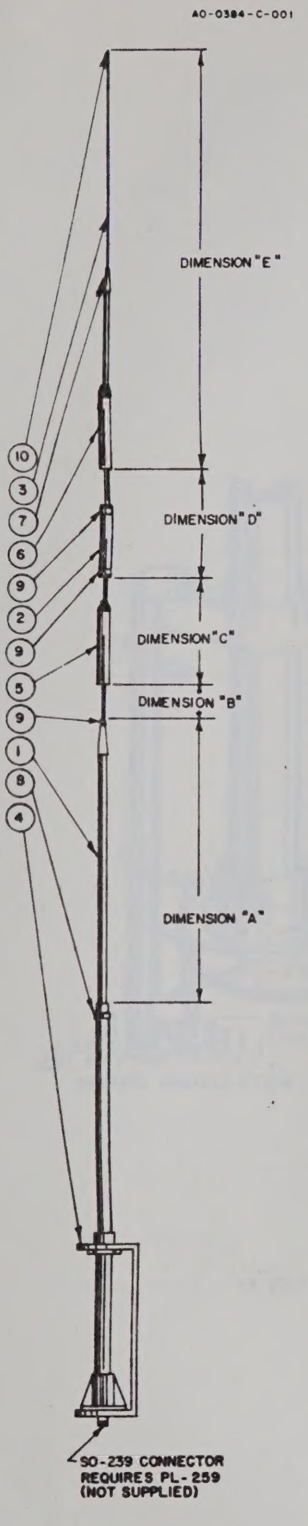


Figure 1



( ) Select the M2 section (item 1) and slip it into the base assembly of tubing. Measure dimension A as shown in Figure 2-according to your mounting location and mode of transmission. Now tighten the compression clamp *slightly.*

( ) Select the 1" compression clamp (item 9) and its associated hardware (items 14 and 15) and assemble as shown in Figure 1. Slip the assembled clamp over the M2 section but *do not tighten at this time.*

( ) Select the 10-meter trap (item 5) and slip it into the M2 section with the plastic cap at the top. Measure 2¼" from the edge of the M2 section to the bottom of the trap as shown in the illustration (dimension B). Now tighten the compression clamp *slightly.*

( ) Select the M3 section (item 2) and 1" compression clamp. Assemble the compression clamp and slip it onto the M3 section. Now slip the M3 section (end with compression clamp installed) over the 10-meter trap and measure dimension C according to your mounting location and mode of transmission. Tighten compression clamp *slightly.*

( ) Assemble the remaining 1" compression clamp and slip it over the M3 section.

( ) Select the 15-meter trap (item 6) and slip it into the M3 section with the plastic cap at the top. Measure dimension D according to your mounting location and mode of transmission. Tighten compression clamp *slightly.*

( ) Assemble the ½" compression clamp (item 7) and slip it over the 15-meter trap.

( ) Select the M4 section (item 3) and slip it into the 15-meter trap. Measure dimension E according to your mounting location and mode of transmission then tighten the compression clamp *slightly.*

( ) Carefully recheck all dimensions — then tighten all compression clamps securely.

( ) Place the 7/16" caplug (item 10) on the end of the antenna.

	Ground		**Roof**	
	CW	**Phone**	**CW**	**Phone**
Dimension A	32½"	26½"	47"	39½"
Dimension B	2¼"	2¼"	2¼"	2¼"
Dimension C	11⅝"	11⅝"	11⅜"	11⅜"
Dimension D	7⅛"	7"	7"	7"
Dimension E	44¾"	44¾"	45¾"	45¾"

Figure 2

( ) Install the two U-bolts (item 13) using the 5/16" nuts and lockwashers (items 16 and 19) as shown in Figure 3.

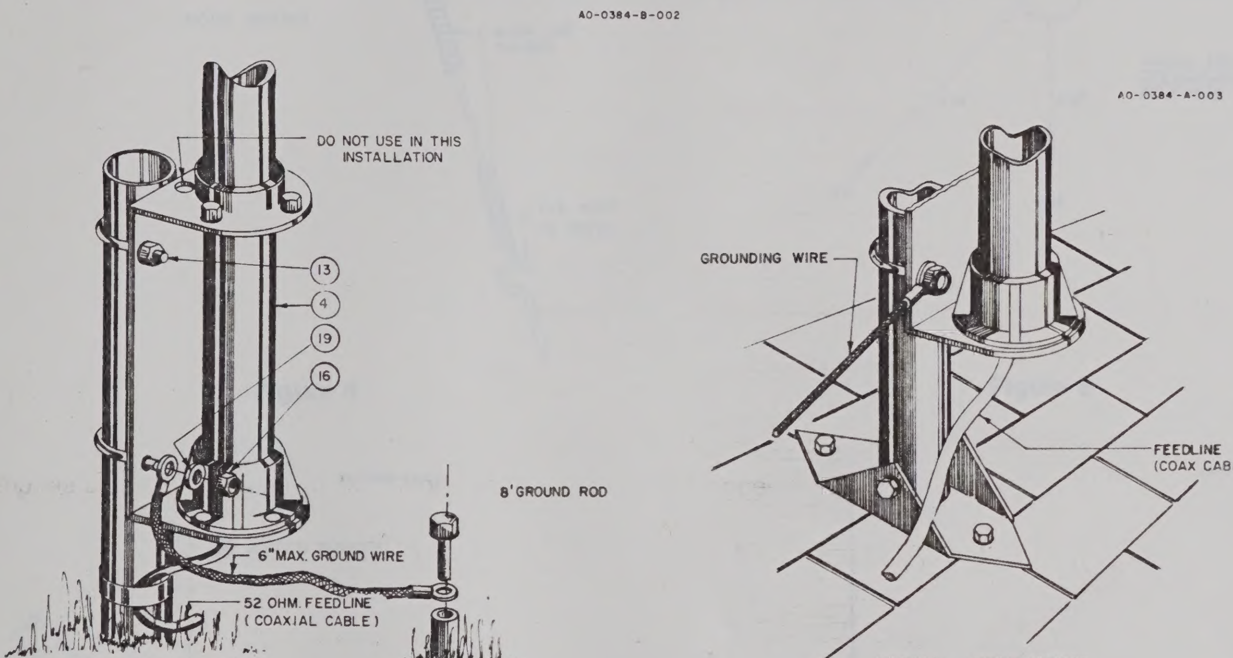
( ) Select the four ¼"-20 x ¾" screws, nuts, and lockwashers (items 12, 17, and 20) and install on the base assembly. If the antenna is to be ground mounted, tighten these screws securely. If the antenna is to be roof mounted, refer to Figure 4 before tightening these screws. *A radial system must be added for proper operation when this antenna is mounted on the roof.* This radial system can also act as the guying system. The radials must be the length shown in Figure 5 after the strain insulators are installed. If you prefer, you may obtain a radial system specifically designed for your 12 AVQ by asking your local Hy-Gain dealer for the 12 RMQ.

CAUTION

If copper is used for the radials, solder lugs must be used to prevent dissimilar metal corrosion from occurring.

( ) Ground your radial system by connecting the base of the antenna to proper ground using # 10 or larger copper or aluminum wire. A proper ground consists of an 8 ft. copper clad, steel ground rod driven into the ground as close as possible to the antenna base.

( ) If the antenna is ground mounted, install as shown in Figure 3. Ground the base of the antenna as described above.



GROUND INSTALLATION

TYPICAL ROOF MOUNT

NOTE: For improved performance, use more ground rods. Any good electrical connection can be used. (Not supplied.)

Figure 3

( ) Connect the coaxial cable as shown in the drawings. Weatherproof the connection using Pli-O-Bond, neoprene, or some similar substance to prevent water from ruining the coax.

( ) For total lightning protection, it is recommended that you use a Hy-Gain Model LA-1 lightning arrestor available from your local Hy-Gain dealer.

WARNING

Keep this antenna out of reach of children or pets. The antenna radials are hot with rf proportional to the operating power.

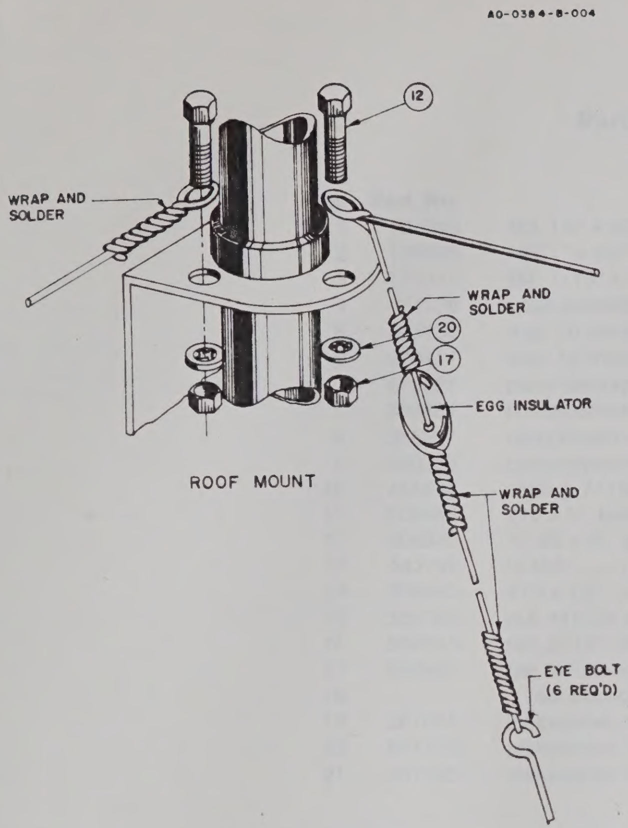


Figure 4

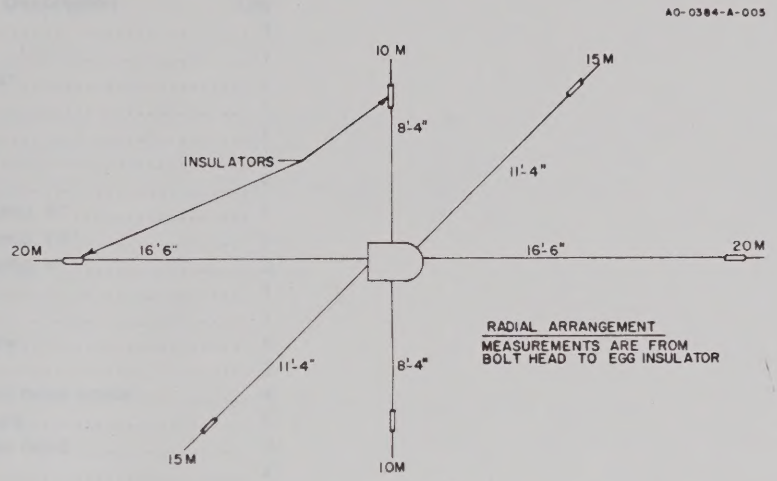
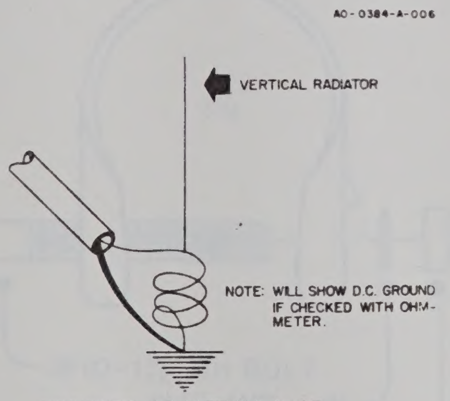
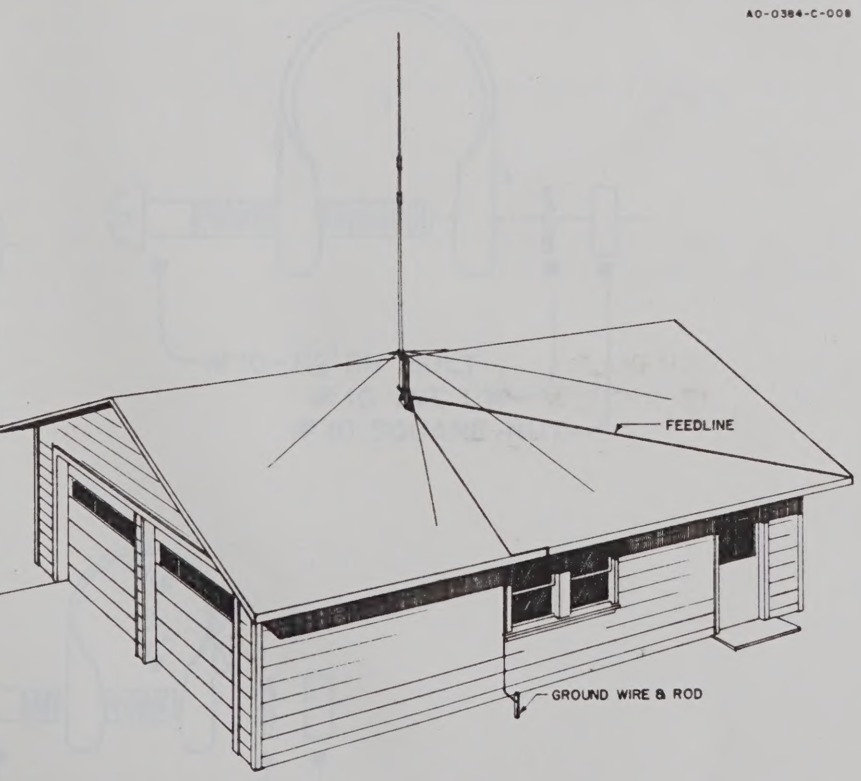


Figure 5



SCHEMATIC OF ANTENNA BASE



COMPLETED ROOF MOUNT INSTALLATION OF 12AVQ

Parts List

Item	Part. No.	Description	Qty
1	190306	M3, 1⅛" x 60"	1
2	190605	M3, 1" x 6½"	1
3	178416	M4, 7/16" x 28¾"	1
4	877128	base assembly	1
5	877132	trap, 10-meter	1
6	878417	trap, 15-meter	1
	879228	parts package	1
7	380284	compression clamp, ½"	1
8	380287	compression clamp, 1¼"	1
9	380286	compression clamp, 1"	3
10	455644	caplug, 7/16"	1
11	506455	#10 x 1", bolt	1
12	506325	¼"-20 x ¾", screw	4
13	543792	U-bolt	2
14	506445	#10 x 1½", round head screw	4
15	555362	nut, #10-24 square	5
16	556945	nut, 5/16"-18 hex head	4
17	556960	nut, ¼"-20 hex	4
18		(not applicable)	
19	567075	lockwasher, 5/16"	4
20	567110	lockwasher, ¼"	4
21	567125	lockwasher, #10	1

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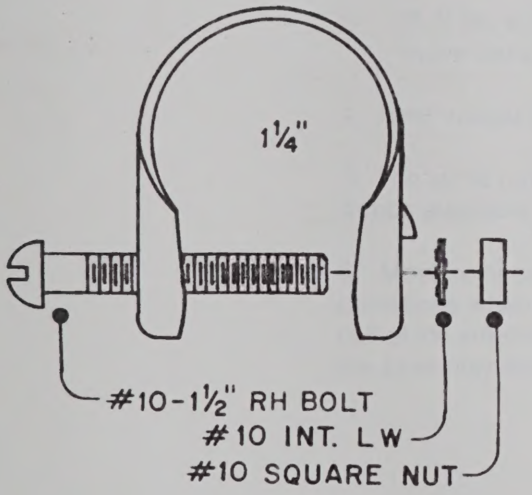

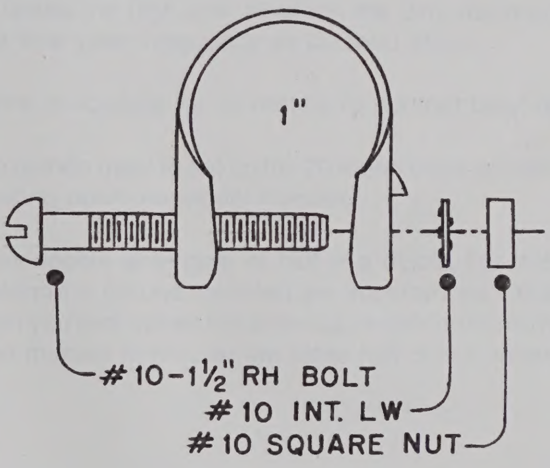

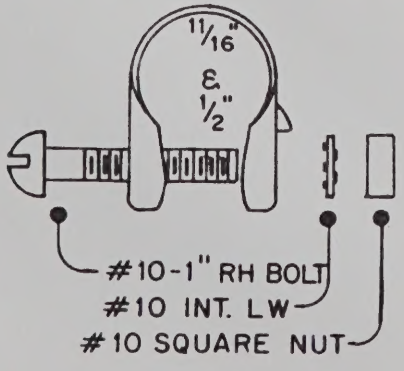

Final Adjustment for Setting the 12AVQ, 14AVQ, and 18AVT Antennas

1. The antenna operates progressively from 10 thru the lowest band available. Even though you may not be using 10 meters at the present time, 10 meters must be adjusted, because any adjustment made between the base and the first trap automatically changes all of the bands at a later date.

2. Because every antenna installation is influenced by the soil conditions and the proximity effect of nearby objects, the dimensions in the manual must be fine tuned to put the antenna exactly where you want it on each band.

3. Beginning on 10 meters, make a VSWR curve checking the low end, center and high end of the band. This will indicate if the antenna favors the low end or the high end as installed.

   A. If it favors the low end, shorten the 10 meter adjustment one inch or no more than 1½ inches. Run another VSWR measurement. Now you will have an indication of how far that distance moved the antenna in your location. Make what additional adjustments are indicated by the VSWR curve to put 10 meters exactly on the portion of the band you desire as your center operation frequency.

   B. If the antenna favors the high end, lengthen the dimension correspondingly to move the antenna to a lower frequency as outlined above.

4. Next, repeat this same procedure for 15 meters to put that band on frequency.

5. The same procedure is then used to set up the 20 meter band, as well as the remaining bands available, depending upon the model involved.

6. Most verticals are monopole antennas, or half of a dipole. For this reason, the soil conditions when the antenna is ground mounted are important as it makes up the other half of the antenna. When you roof mount the antenna, radials must be used as outlined in the assembly instruction manual to provide the other half of the antenna.

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